THERMAL PRINTING SOLUTIONS

TPOS PRINTER SERIES

USER MANUAL

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EVOLUTIONS

Date	Issue	Modifications
03/2003	Z	Creation
04/2003	A	Update: addition of power supply chapter
01/2009	B	Addition of 2 control codes: - Generate Pulse for CDKO - Select or Cancel Unsolicited Status Mode (USM)

CONTENTS

1 YOUR PRINTER 6

1.1 Package 6

1.2 General description 6

1.3 Printer location 7

2 PLUGGING & CONNECTING YOUR PRINTER 8

2.1 Connecting the power supply 8

2.2 Connecting the printer 8

2.3 Connector pin out / features 9

2.3.1 Power connector 9

2.3.2 Communications interface connectors 9

2.3.3 Cash drawer kick-out connector (*optional*) 10

2.3.4 USB connector 10

2.3.4.1 Capabilities: 10

2.3.4.2 Connector: 10

2.3.4.3 Interface: 11

2.3.4.4 Other information: 11

2.4 General safety specification 11

3 LOADING PAPER 12

4 TECHNICAL SPECIFICATIONS 13

5 ENVIRONMENTAL CONDITIONS 14

6 POWER SUPPLY 14

7 PRINT FEATURES 15

7.1 Characters specification 15

7.2 Character sets 16

7.2.1 Code Page 858 16

7.2.2 Code page 437 17

8 CUTTING FEATURES 18

9 STANDARD DEFAULT SETTINGS 18

10 DUTY CYCLE 18

11 LIST OF CONTROL CODES 19

12 COMMAND DESCRIPTION 21

12.1 Command conventions 21
12.2 Reset commands 22
12.2.1 Initialize Printer 22
12.2.2 Reset Firmware 22
12.3 Paper cut commands 23
12.3.1 Perform Full Knife Cut 23
12.3.2 Perform Partial Knife Cut 23
12.3.3 Set Partial Cut Distance 23
12.3.4 Select Cut Mode and Cut Paper 24
12.4 Vertical positioning and print commands 25
12.4.1 Print and Feed One Line 25
12.4.2 Activate Carriage Return 25
12.4.3 Feed *n* Print Lines 25
12.4.4 Feed *n* Dot Rows 26
12.4.5 Set Line Spacing to 1/6 Inch 26
12.4.6 Set Line Spacing 26
12.4.7 Print and Feed Paper 27
12.4.8 Print and Feed *n* Lines 27
12.5 Horizontal positioning commands 28
12.5.1 Horizontal Tab 28
12.5.2 Set Right-Side Character Spacing 28
12.5.3 Set Absolute Starting Position 29
12.5.4 Set Horizontal Tab Positions 30
12.5.5 Set Relative Print Position 31
12.5.6 Select Justification 32
12.5.7 Set Left Margin 32
12.5.8 Set Printing Area Width 33
12.6 Print characteristics commands 34
12.6.1 Select Print Mode 34
12.6.2 Select or Cancel Underline Mode 35
12.6.3 Select Or Cancel White/Black Reverse Print Mode 35
12.7 Font commands 36
12.7.1 Select International Character Set 36
12.8 Graphics commands 37
12.8.1 Print Raster Graphics 37
12.9 Logo commands 37
12.9.1 Select the Current Logo 37
12.9.2 Define Downloaded Bit Image 38
12.9.3 Print Downloaded Bit Image 39
12.9.4 Return Logo Checksum 39

12.10 Printer status commands 40
12.10.1 Transmit Paper Sensor Status 40
12.10.2 Transmit Printer ID 41
12.10.3 Transmit Printer ID, Remote Diagnostics Extension 42
12.10.4 Transmit Status 43
12.10.5 Send Printer Software Version 43
12.10.6 Return SRAM Size 44
12.10.7 Transmit Selected A/D Channel 44
12.11 Real time commands 45
12.11.1 Rules for Using Real Time Commands 45
12.11.2 Moving Data Through the Buffer 46
12.11.3 Busy Line and Fault Conditions 46
12.11.4 Real Time Recovery from Fault 47
12.11.5 Real Time Status Transmission 48
12.12 Bar code commands 51
12.12.1 Select Printing Position of HRI Characters 51
12.12.2 Select Pitch of HRI Characters 51
12.12.3 Select Bar Code Height 52
12.12.4 Select Bar Code Width 52
12.12.5 Print Bar Code 53
12.13 Flash firmware download commands 55
12.13.1 Firmware Download Sequence 55
12.13.2 Commands 56
12.13.2.1 Switch to Flash Download Mode 56
12.13.2.2 Request Flash Memory Size 56
12.13.2.3 Select Flash Memory Sector to Download 57
12.13.2.4 Get Flash Firmware CRC Status 57
12.13.2.5 Return Boot Sector CRC 57
12.13.2.6 Erase All Flash Contents Except Boot Sector 58
12.13.2.7 Return Main Program Flash CRC 58
12.13.2.8 Erase Selected Flash Sector 58
12.13.2.9 Download to Active Flash Sector 59
12.13.2.10 Erase Boot Sector + Download New Boot Code 60
12.14 ***User flash memory commands 61***
12.14.1 Erase User Flash Sector 61
12.14.2 Return User Flash Memory Allocation Status 61
12.15 ***Peripheral control commands 62***
12.15.1 Set Communication Interface Parameters 62
12.15.2 Set Knife Option 63
12.15.3 Set Print Density 64
12.15.4 SeLECT OR CANCEL UNSOLICITED STATUS MODE 64
12.15.5 Reset EEPROM 65

12.15.6 Print Test Form 66
12.15.7 GENERATE PULSE FOR CDKO 66
13 TROUBLESHOOTING 67
13.1 Light indicator 67
13.2 Problems & Solutions 67
13.2.1 Printer Problems 67
13.2.2 Printer LED Diagnostic 68
13.2.3 Printing Problems 69
13.2.4 Auto Cutting Problems 70
14 CLEANING YOUR PRINTER 70
15 SPARES 71

1 YOUR PRINTER

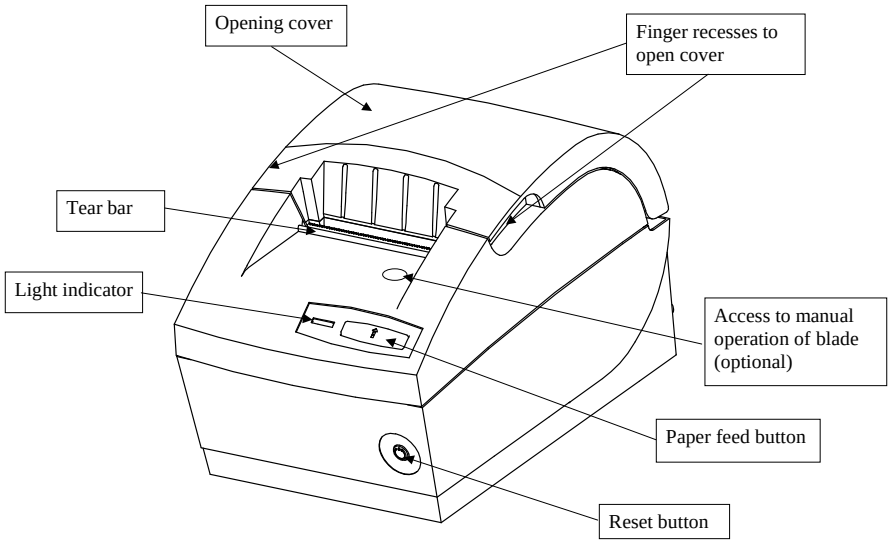
1.1 Package

The packing box contains:

- Printer
- Power supply (optional)
- Power cable to be set between power supply and power network (optional)
- Set Up Guide

1.2 General description

The TPOS is a complete printer designed with the clamshell easy paper loading system.



Note 1: when resetting the printer, every running operation is stopped and all information sent before resetting are lost.

Note 2: to print a self-test ticket, activate both ON and paper feed buttons according to the following instructions:

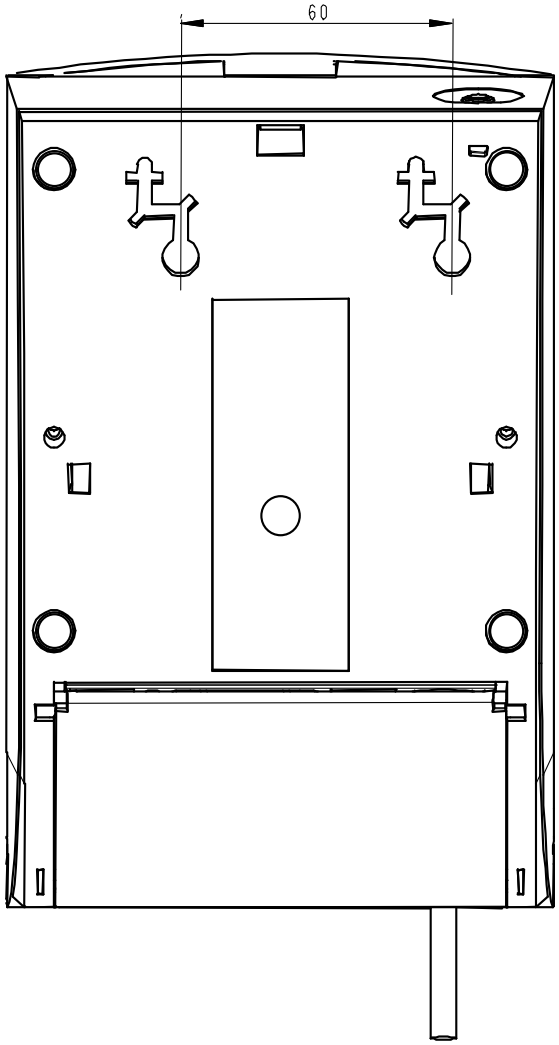
- Switch the power OFF.
- Activate the paper feed button while turning the power ON.
- Release the ON/OFF button keeping the paper feed button pushed.
- Release the paper feed button as soon as the printer starts to print the self-test ticket.

1.3 Printer location

This printer can be used either horizontally or wall mounted (fixing holes on printer bottom for 3 mm screws, not included).
The external dimensions (W×L×H) are: 121×185×125 mm (with cover closed).
The printer should be set on a stable holder in a place where the following conditions are achieved:

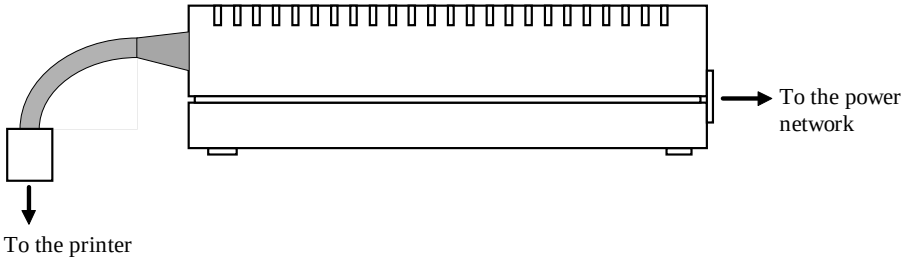
- temperature from 0 to 50℃ for operating (-40 to + 70 for storage).
- no risk of water exposure.
- no mechanical vibration or stress.

Wall mounting diagram:



2 PLUGGING & CONNECTING YOUR PRINTER

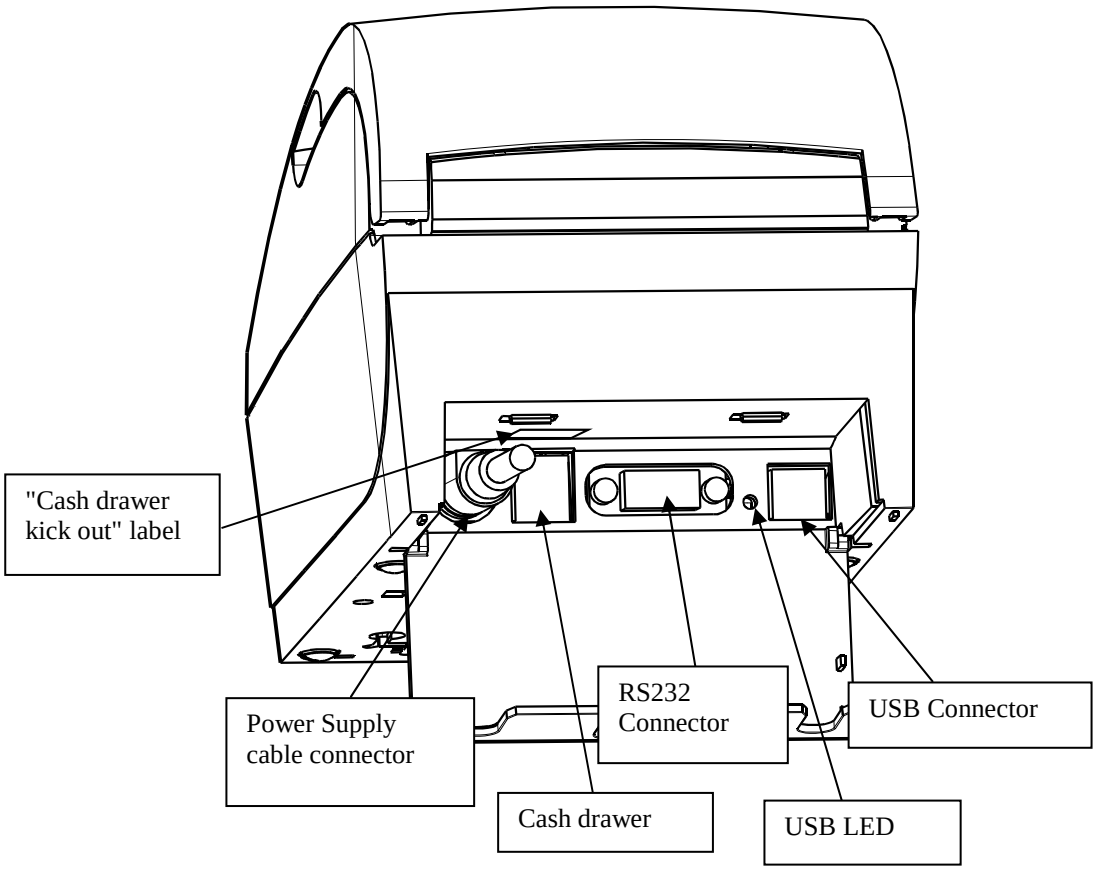
2.1 Connecting the power supply



The cable to connect the printer to the power network is included in the package.

2.2 Connecting the printer

Connections have to be set at the rear of printer: open the rear-door and set the power supply and interface cables as shown on the following drawing.



***Note*: All connectors should be SELV types in order to safety standards** (Safety extra low voltage).

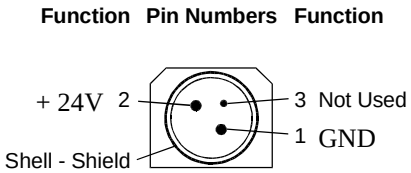
2.3 Connector pin out / features

To reduce the electromagnetic emissions and susceptibility, all cables should be shielded. If you are not using cables supplied by Axiohm for this purpose, make sure that your cables match the printer and are rated at the appropriate voltage and current capacities.

***Use of an inappropriate cable may seriously damage your printer!**

2.3.1 Power connector

The connector is a shielded 3-pin female mini-Din plug.

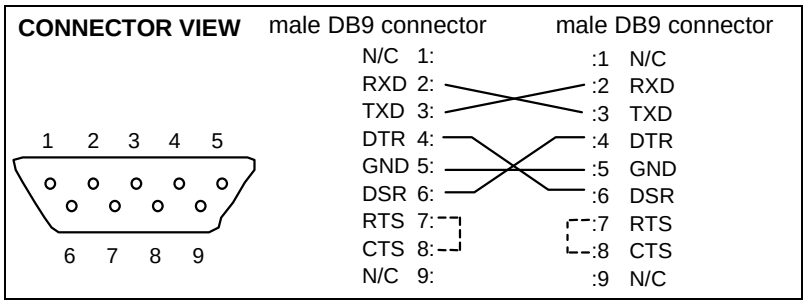


2.3.2 Communications interface connectors

RS232 interface uses 9-pin D-type male connectors.

RS232 Connector

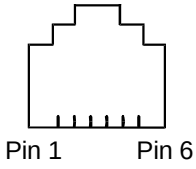
Cable for DTR/DSR protocol



Note: RTS/CTS should be tied together if using DOS print commands on a PC station.

2.3.3 Cash drawer kick-out connector (*optional*)

The following illustration shows the pinouts for the cash drawer connector on the printer.



Pin Number	Cash Drawer Connector
1	Switch (-ve)
2	Drawer 2 Solenoid
3	+24 Volts (to Solenoid +ve)
4	Status Switch +
5	Drawer 1 Solenoid (common with drawer2)
6	Frame Ground

The connector used to open a cash drawer and monitor, whether the drawer is opened or closed, is a 6-pin modular RJ11 connector.

CDKO drive signal: 24V / 1A maximum

Important: The minimum resistance of the solenoid recommended = 24 Ω.

$$\text{CDKO duty: } \frac{tON}{tON + tOFF} \oslash 0.2$$

Maximum tOFF = 510 ms

Do not connect telecommunication network to the drawer kick out connector.

2.3.4 USB connector

The connector is located at the rear of the printer, and is of B-type.
The maximum recommended cable length is 3 meters.
Refer to USB specification rev 1.1, chapter 6, for more information.

USB PARAMETERS

Axiohm's implementation of USB complies with "Universal Serial Bus Specification" revision 1.1.

2.3.4.1 Capabilities:

TPOS is only a device, and doesn't provide hub capabilities.
Full speed communications (12Mbits/sec) are supported.

2.3.4.2 Connector:

The connector is located at the rear of the printer, and is of B-type
Refer to USB specification rev 1.1 chapter 6 for more information.

2.3.4.3 Interface:

The data is exchanged between host and printer via four endpoints:

1) Endpoint 0x00: CONTROL

Default endpoint

2) Endpoint 0x02: BULK OUT

For transmission of all printable data and commands from host to printer

3) Endpoint 0x82: BULK IN

For return of all synchronous data, status or other types of information except unsolicited status mode messages, from printer to host

4) Endpoint 0x01: INTERRUPT OUT

For transmission of real time commands from host to printer.

2.3.4.4 Other information:

Vendor Id
Axiohm USB Vendor Id = 0x05D9

Product Id
TPOS Product Id = 0xA000

2.4 General safety specification

All communication connectors should be SELV connectors in order to meet safety standards.

Use of an inappropriate cable or power supply may seriously damage your printer and affect safety standards of the printer. The power supply main connector should be easily accessed to enable power disconnection.

The power supply cable is a disconnect device.

Power supply input requirements: 110/240 VAC, 50/60 Hz.
Operating temperature: 0 to 50℃.

3 LOADING PAPER

The Clamshell design allows easy paper loading.

To load paper:

- Open the cover using finger recesses.
- Set the paper roll as indicated on the inside of the cover (see drawing).
- Close the cover leaving a small length of paper out.
- Cut the small length left with the tear bar.

Your paper roll is set.

***Notes*:**

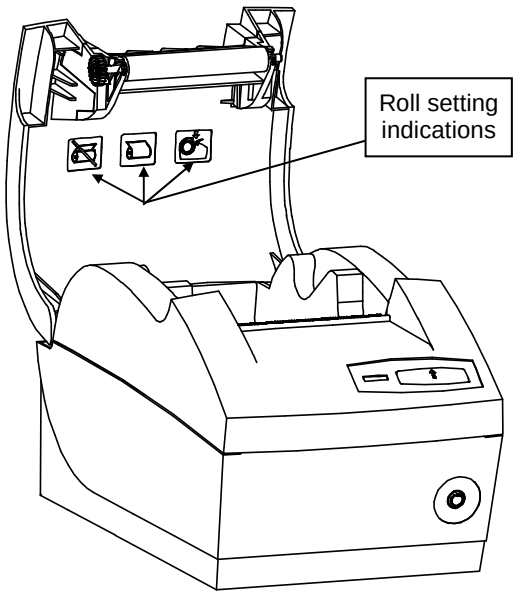
The paper used should be recommended by AXIOHM.

The paper width must be 58 $^{0/-0.3}$ mm.

The maximum paper roll diameter is 90 mm.

Warning: If the paper width should be less than 57.7 mm, it is recommended to check that the printing is centered according to the paper.

The paper must not be attached to the paper roll spindle.

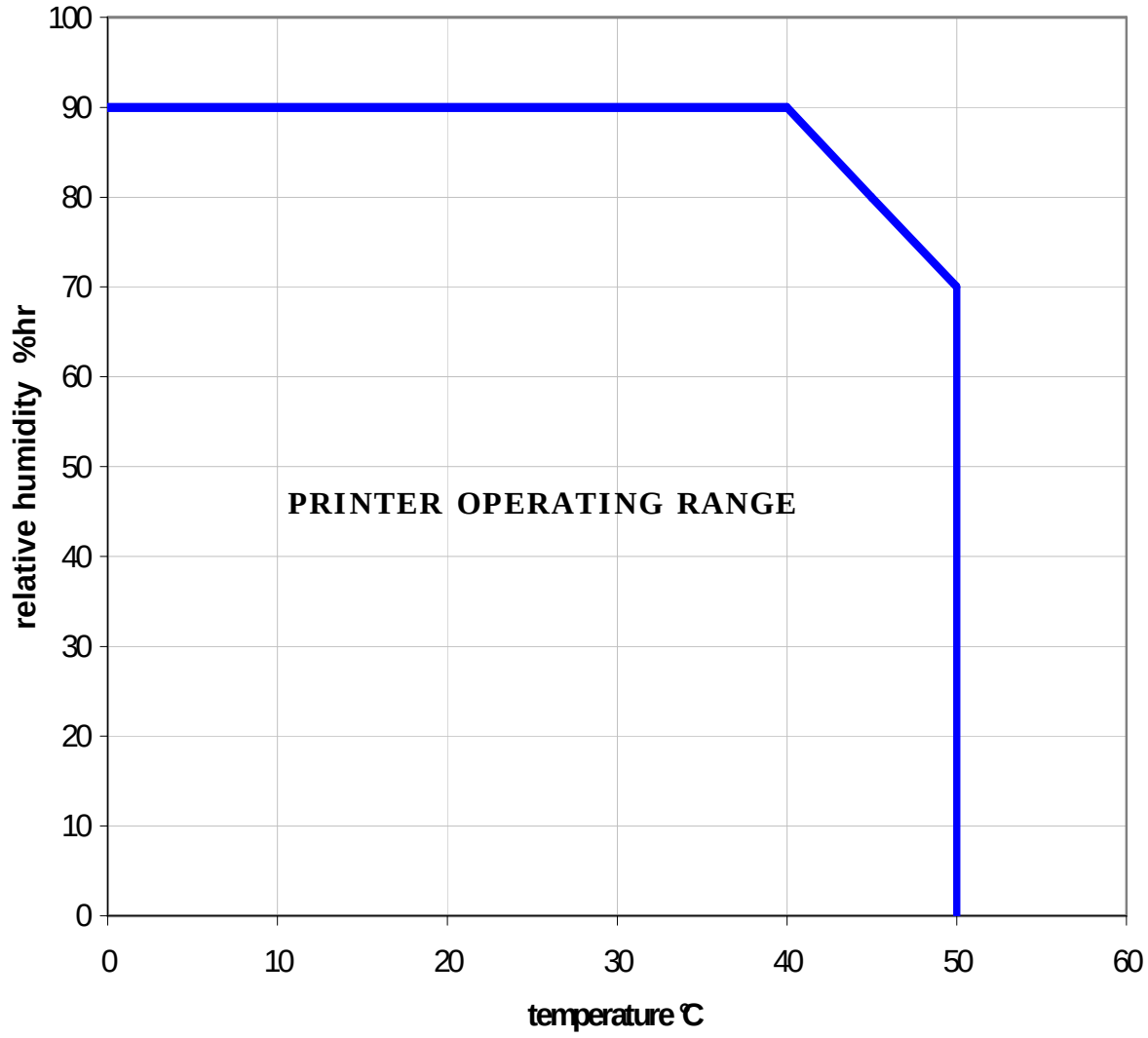


4 TECHNICAL SPECIFICATIONS

ITEM	VALUE	UNITS
Printing method	Static thermal dot line printing	-
Paper loading	Clamshell	-
Number of resistor dots	448	-
Resolution	8	dots/mm
Printing width	56	mm
Printing speed*	100	mm/s
Paper width	58	mm
Paper roll diameter	90 max	mm
Data Buffer	1k	bytes
Head temperature detection	By Thermistor	-
Paper empty detection	Opto-sensor	-
Printer voltage range	24 +/- 10%	V DC
Current consumption	24V, 2A	from power supply
Power supply	110-220 V AC / 24 V DC 50-60	V Hz
[1]Maximum duty cycle (*to prevent the motor temperature from rising*) (Max 2 sec "On")	30 at 25℃ room temperature 20 at 50℃	%
Storage range (except for paper)	-40 / +70	℃
Operating range	0 to 50	℃
Electrical life time	10×10^8	pulses
Mechanical life time (*abrasion*)	100	Km
Cutter life time	1000000	cuts
Over all dimensions: Width	121	mm
Depth	180	mm
Height	124	mm
Weight (*without paper roll*)	600	g
Recommended paper	KANZAN KP 440	-
Maximum paper thickness: tearbar	80	µ
cutter	65	µ
Interface	Cash drawer / RS 232 C / USB 1.1	RJ11 / DB 9 / USB type B
Certification: EMI	CE Class A, FCC Class A.	-
Safety	UL 60950	-

* Speed will depend on the paper type, %of dots on, power supply available, and temperature[1].

5 ENVIRONMENTAL CONDITIONS



6 POWER SUPPLY

Input power printer : DC 24V

Minimum power recommended : DC 24V 2.5A/60W

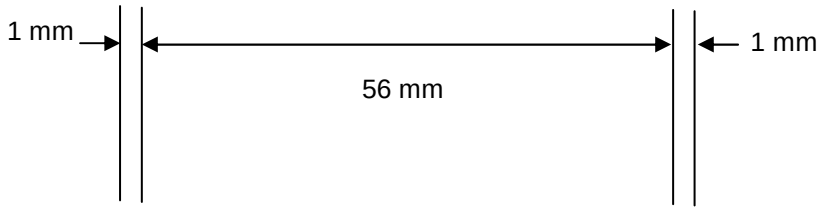
Axiohm cannot guarantee the correct operation of the printer if another power supply is used other than an Axiohm power supply.

7 PRINT FEATURES

7.1 Characters specification

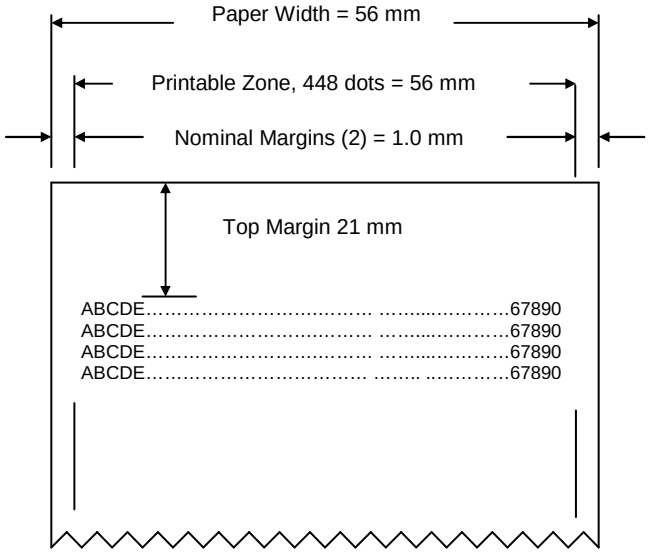
Cell size:	16 x 24 (*default*)
	12 x 24
Characters per line:	37 columns / 28 columns

Print width:



Print zone for 56 mm paper:

- 448 dots (addressable) @ 8 dots/mm, centered on 58 mm.
- Standard mode: minimum margins 1.0 mm (0.040 inches).
- Top margin to manual knife cut: 21 mm



7.2 Character sets

7.2.1 Code Page 858

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⁝⁝ 176	C0 └ 192	D0 ð 208	E0 Ó 224	F0 – 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ⁞⁞ 177	C1 ┴ 193	D1 Đ 209	E1 ß 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ▒ 178	C2 ┬ 194	D2 Ê 210	E2 Ô 226	F2 ‗ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 │ 179	C3 ├ 195	D3 Ë 211	E3 Ò 227	F3 ¾ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ┤ 180	C4 ─ 196	D4 È 212	E4 õ 228	F4 ¶ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 Á 181	C5 ┼ 197	D5 € 213	E5 Õ 229	F5 § 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 Â 182	C6 ã 198	D6 Í 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 À 183	C7 Ã 199	D7 Î 215	E7 þ 231	F7 ¸ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 © 184	C8 ╚ 200	D8 Ï 216	E8 Þ 232	F8 º 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ® 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Ú 233	F9 ¨ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA Û 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ø 155	AB ½ 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB Ù 235	FB ¹ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ý 236	FC ³ 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D Ø 157	AD ¡ 173	BD ¢ 189	CD ═ 205	DD ¦ 221	ED Ý 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E × 158	AE « 174	BE ¥ 190	CE ╬ 206	DE Ì 222	EE ¯ 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Å 143	9F ƒ 159	AF » 175	BF ┐ 191	CF ¤ 207	DF ▀ 223	EF ´ 239	FF 255

Note: This code page is not available with all models.

7.2.2 Code page 437

00 0	10 16	20 SP 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⣿ 176	C0 └ 192	D0 ╨ 208	E0 ∝ 224	F0 ≡ 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ⣿ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ⣿ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 ⣿ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ⣿ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 ⣿ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 ⣿ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 ⣿ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 ⣿ 184	C8 ╚ 200	D8 ╪ 216	E8 ϕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ⌐ 169	B9 ⣿ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 ● 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ⣿ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA • 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ¢ 155	AB ½ 171	BB ⣿ 187	CB ╦ 203	DB ▉ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ⣿ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D ¥ 157	AD ¡ 173	BD ⣿ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E Pt 158	AE « 174	BE ⣿ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F DEL △ 127	8F Å 143	9F ƒ 159	AF » 175	BF ⣿ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF BLANK 255

Note: This code page is not available with all models.

8 CUTTING FEATURES

The printer is equipped with a high performance guillotine cutter that can provide total and partial cuts by software command.

The partial cut leaves a 2 mm center tab.

9 STANDARD DEFAULT SETTINGS

Print density:	100%
Pre heating:	Off
Baud rate:	115200
Parity:	None
Flow control:	Dtr/Dsr
Reception error:	Ignore

10 DUTY CYCLE

25℃	Duty cycle is 30%
50℃	Duty cycle is 20%

11 LIST OF CONTROL CODES

Code (Hexadecimal)	Command	Page
09	Horizontal Tab	28
0A	Print and Feed One Line	25
0D	Activate Carriage Return	25
10 04 *n*	Real Time Status Transmission	48
10 05 *n*	Real Time Recovery from Fault	47
11 *n1...nl*	Print Raster Graphics	37
14 *n*	Feed *n* Print Lines	25
15 *n*	Feed *n* Dot Rows	26
1B 20 *n*	Set Right-Side Character Spacing	28
1B 21 *n*	Select Print Mode	34
1B 24 *n1 n2*	Set Absolute Starting Position	29
1B 2D *n*	Select or Cancel Underline Mode	35
1B 32	Set Line Spacing to 1/6 Inch	26
1B 33 *n*	Set Line Spacing	26
1B 40	Initialize Printer	22
1B 44 [*n*]...*k* NUL	Set Horizontal Tab Positions	30
1B 4A *n*	Print and Feed Paper	27
1B 52 *n*	Select International Character Set	36
1B 5B 7D	Switch to Flash Download Mode	56
1B 5C *n1 n2*	Set Relative Print Position	31
1B 61 *n*	Select Justification	32
1B 64 *n*	Print and Feed *n* Lines	27
1B 69	Perform Full Knife Cut	23
1B 6D	Perform Partial Knife Cut	23
1B 70 m nl n2	Generate pulse for CDKO	66
1B 76	Transmit Paper Sensor Status	40
1D 01	Request Flash Memory Size	56
1D 02 *nn*	Select Flash Memory Sector to Download	57
1D 06	Get Flash Firmware CRC Status	57
1D 07	Return Boot Sector CRC	57
1D 08	Return SRAM Size	44
1D 0E	Erase All Flash Contents Except Boot Sector	58
1D 0F	Return Main Program Flash CRC	58

1D 10 *n*	Erase Selected Flash Sector	58
1D 11 *al ah cl ch*	Download to Active Flash Sector	59
1D 23 *n*	Select the Current Logo	37
1D 2A *n1 n2 d1...dn*]	Define Downloaded Bit Image	38
1D 2F *m*	Print Downloaded Bit Image	39
1D 40 *n*	Erase User Flash Sector	61
1D 42 *n*	Select or Cancel White/Black Reverse Print	35
1D 48 *n*	Select Printing Position of HRI Characters	51
1D 49 *n*	Transmit Printer ID	41
1D 49 40 *n*	Transmit Printer ID, Remote Diagnostics Extension	42
1D 4C *nL nH*	Set Left Margin	32
1D 56 *m*	Select Cut Mode and Cut Paper	24
1D 56 *m n*	Select Cut Mode and Cut Paper	24
1D 57 *nL nH*	Set Printing Area Width	33
1D 61 n	Select or Cancel Unsolicited Status Mode	64
1D 66 *n*	Select Pitch of HRI Characters	51
1D 68 *n*	Select Bar Code Height	52
1D 6B *m d1...dn*	Print Bar Code	53
1D 6B *m d1...dk* NUL	Print Bar Code	53
1D 72 *n*	Transmit Status	43
1D 77 *n*	Select Bar Code Width	52
1D FF	Reset Firmware	22
1F 01 *d1.. d8192*	Erase Boot Sector + Download New Boot	60
1F 02 *n1 n2 n3 n4 n5*	Set Communication Interface Parameters	62
1F 03 02 *n*	Set Knife Option	63
1F 0B 4E 52 4A *n*	Set Print Density	64
1F 0D 43 4C 45 *n*	Reset EEPROM	65
1F 56	Send Printer Software Version	43
1F 65 *n*	Return Logo Checksum	39
1F 74	Print Test Form	66
1D 6C *m*	Transmit Selected A/D Channel	44
1F 03 0A *n*	Set Partial Cut Distance	23
1F 77 *n*	Return User Flash Memory Allocation Status	61

12 COMMAND DESCRIPTION

12.1 Command conventions

The following information describes how each command is organized:

Command Name
A designation (not the ASCII code) used to identify the command.

Description
A brief summary of the command, followed by detailed information, if necessary.

ASCII	the ASCII control code
Hexadecimal	the Hexadecimal control code
Decimal	the Decimal control code
Value or Values	a description of the command operand values
Range	the upper and lower limits of the command operand
Default	the command operand default after printer reset
Formulas	any formula used for this command.

Exceptions
Describes any exceptions to this command, for example, other commands that the command cannot be used with.

Related Information
This section describes any related information for this command and provides references to other sections for additional information.

12.2 Reset commands

12.2.1 INITIALIZE PRINTER

Clears the print line buffer and resets the printer to the default settings for the startup configuration (refer to Default settings below).

Single Wide, Single-High and Left-Aligned characters and reset active logo.

Default bar code settings

ASCII	ESC @	
Hexadecimal	**1B 40**	
Decimal	27 64	
Default	Character Pitch	12.7 CPI
	Number of Columns Width	28 characters
	Extra Dot Rows	3
	Character Set	Default
	Printing Position	Column One

12.2.2 RESET FIRMWARE

Reboots the printer.

ASCII	GS (SPACE)
Hexadecimal	**1D FF**
Decimal	29 255

12.3 Paper cut commands

12.3.1 PERFORM FULL KNIFE CUT

Cuts the receipt. Hex 1B 69.

ASCII	ESC *i*
Hexadecimal	**1B 69**
Decimal	27 105

12.3.2 PERFORM PARTIAL KNIFE CUT

Partially cuts the receipt. The default setting leaves 0.20 inches (2 mm) of paper in the middle. See Setting Partial Cut Distance in Diagnostics.

ASCII	ESC *m*
Hexadecimal	**1B 6D**
Decimal	27 109

Formulas
The cut edge is 144 dot rows or 0.49 inch (12.5 mm) above the print station.

Exceptions
The command is valid only at the beginning of a line.

12.3.3 SET PARTIAL CUT DISTANCE

Allows regulating the partial cut.

ASCII	USETXLF *n*
Hexadecimal	**1F 03 0A *n***
Decimal	310310 *n*

Value of n:

n = 0	160 steps
n = 1	165 steps
n = 2	170 steps
n = 3	175 steps
n = 4	180 steps

12.3.4 SELECT CUT MODE AND CUT PAPER

Selects a mode for cutting paper and cuts the paper. There are two formats for this command: one requiring one parameter *m*; the other requiring two parameters, *m* and *n*; the format is indicated by the parameter *m.*

ASCII	GS V *m*	GS V *m n*
Hexadecimal	**1D 56 *m***	**1D 56 *m n***
Decimal	29 86 *m*	29 86 *m n*

Value of *m* Selects the mode as shown in the table

Value of *n* Determines the cutting position

Operand: *m* = cut mode

n = additional distance to feed prior to cut beyond the cut position

Limit:	OPTION 1:		OPTION 2:	
	Decimal:	$0 \le m \le 1$; $48 \le m \le 49$	$65 \le m \le 66$	$0 \le n \le 255$
	Hex:	$00 \le m \le 1$; $30 \le m \le 31$	$41 \le m \le 42$	$00 \le n \le FF$

"GS V" OPERAND DEFINITION		
M		**Cut mode**
Decimal	**Hex**	
0, 48	00, 30	Full cut
1, 49	01, 31	Partial cut
65	41	Feeds paper *n* steps beyond the cut position, then executes a full cut
66	42	Feeds paper *n* steps beyond the cut position, then executes a partial cut

12.4 Vertical positioning and print commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt.

12.4.1 PRINT AND FEED ONE LINE

Prints one line from the buffer and feeds paper one line.

ASCII	LF
Hexadecimal	**0A**
Decimal	10

12.4.2 ACTIVATE CARRIAGE RETURN

Prints one line from the buffer and feeds paper one line.
Some applications expect the command to be ignored, while others use it as print command.

ASCII	CR
Hexadecimal	**0D**
Decimal	13

12.4.3 FEED *n* PRINT LINES

Feeds the paper *n* lines at the current line height without printing; ignored if not at start of line.

ASCII	DC4 *n*
Hexadecimal	**14 *n***
Decimal	20 *n*

Value of *n*	The number of lines to feed at current line height setting.
Range of *n*	0-255

12.4.4 FEED *n* DOT ROWS

Feeds the paper *n* dot rows (*n*/203 inch, *n*/8 mm), without printing.

ASCII	NAK *n*
Hexadecimal	**15 *n***
Decimal	21 *n*

Value of *n* *n*/203 inch

Range of *n* 0-255

12.4.5 SET LINE SPACING TO 1/6 INCH

Sets the default line spacing to 1/6 of an inch (4,23 mm).

ASCII	ESC 2
Hexadecimal	**1B 32**
Decimal	27 50

12.4.6 SET LINE SPACING

Sets the line spacing to *n*/406 inch (*n*/16 mm).
The minimum line spacing is 8.5 lines per inch. The line spacing equals the character height when *n* is too small.

ASCII	ESC 3 *n*
Hexadecimal	**1B 33 *n***
Decimal	27 51 *n*

Value of *n* *n*/406 inch

Range of *n* 0-255

Default 0.13 inch (3.37 mm)

Exceptions
The command is valid only at the beginning of a line.

12.4.7 PRINT AND FEED PAPER

Prints one line from the buffer and feeds the paper *n*/203 inch (*n*/8 mm). The line height equals the character height when *n* is too small.

Sets the print starting position to the beginning of the line, after printing is completed.

ASCII	ESC J *n*
Hexadecimal	**1B 4A *n***
Decimal	27 74 *n*
Value of *n*	*n*/203 inch
Range of *n*	0-255

12.4.8 PRINT AND FEED *N* LINES

Prints one line from the buffer and feeds paper *n* lines at the current line height.

ASCII	ESC d *n*
Hexadecimal	**1B 64 *n***
Decimal	27 100 *n*
Range of *n*	0-255

12.5 Horizontal positioning commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt.

12.5.1 HORIZONTAL TAB

Moves the print position to the next tab position set by the Set Horizontal Tab Positions (1B 44 *n*1 *n*2 ... 00) command. The print position is reset to column one after each line.
When no tabs are defined to the right of the current position, or if the next tab is past the right margin, Line Feed is executed.
Print initialization sets 32 tabs at column 9, 17, 25,

ASCII	HT
Hexadecimal	**09**
Decimal	9

12.5.2 SET RIGHT-SIDE CHARACTER SPACING

Sets the right side character spacing to [*n*].

ASCII	ESC SP *n*
Hexadecimal	**1B 20 *n***
Decimal	27 32 *n*
Range of *n*	0 – 32
Default	0

Note: where n is a multiple of 4.

12.5.3 SET ABSOLUTE STARTING POSITION

Sets the print starting position to the specified number of dots (up to the right margin) from the beginning of the line. The print starting position is reset to the first column after each line.

ASCII	ESC $ *nL nH*
Hexadecimal	**1B 24 *nL nH***
Decimal	27 36 *nL nH*

Value of *n* *n* = Number of dots to be moved from the beginning of the line

nL = Remainder after dividing *n* by 256

nH = Integer after dividing *n* by 256

The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

Note: where nL is a multiple of 4.

Formulas
The example shows how to calculate 280 dots as the absolute starting position.
280/256 = 1, remainder of
24
nL = 24 *nH* = 1

12.5.4 SET HORIZONTAL TAB POSITIONS

Sets up to 32 horizontal tab-position *n* columns from column one, but does not move the print position. See the Horizontal Tab command (09).
The tab positions remain unchanged if the character widths are changed after the tabs are set.
The command ends with hexadecimal 00; hexadecimal 1B 44 00 clears all tabs.

ASCII	ESC D [*n*]*…k* NUL
Hexadecimal	**1B 44 [*n*]*…k* NUL**
Decimal	27 68 [*n*]*…k* 0
Value of *n*	Column number for tab minus one (*n* is always less than or equal to the current selected column width)
Value of *k*	0-32
Default	Every 8 characters from column. 1 (9, 17, 25, etc.) for normal print

Formulas
Set the tab positions in ascending order and put Hex 00 at the end.
Hex 1B 44 00 (number of tabs not specified) clears all tab positions.

Exceptions

The tabs cannot be set higher than the column width of the current pitch: 1-28= Standard pitch

1-37= Compressed pitch

Example:

1B 44 03 04 07 0A 0D 18 00
09 41 09 42 09 43 09 44 09 45 09 46 0A

To obtain (in standard pitch): ---A---B--C--D----------EF

12.5.5 SET RELATIVE PRINT POSITION

Moves the print-starting position the specified number of dots either right (up to the right margin) or left (up to the left margin) of the current position.
The print starting position is reset to the first column after each line.
Any setting that exceeds the printable area is ignored.

ASCII	ESC \ *nL nH*
Hexadecimal	**1B 5C *nL nH***
Decimal	27 92 *nL nH*

Value of *n*

To Move the Relative Starting Position Right of the Current Position:
n = Number of dots to be moved right of the current position
nL = Remainder after dividing *n* by 256
nH = Integer after dividing *n* by 256
The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

To Move the Relative Starting-Position Left of the Current Position:
n = Number of dots to be moved left of the current position
nL = Remainder after dividing (65536-*n*) by 256
nH = Integer after dividing (65536-*n*) by 256
The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

Note: where *nL* is a multiple of 4.

Formulas
To move to the left:
The example shows how to set the relative position 20 dots to the left of the current position.
65536-20 = 65516
65516/256 = 255, remainder of 236
nL = 236, *nH* = 255

To move to the right:
The example shows how to set the relative position 260 dots to the right of the current position.
260/256 = 1, remainder of 4
nL = 04, *nH* = 01

12.5.6 SELECT JUSTIFICATION

Specifies the alignment of characters, logos, and bar codes (see the value of *n* table).

ASCII	ESC a *n*
Hexadecimal	**1B 61 *n***
Decimal	27 97 *n*
Value of *n*	0, 48 = Left aligned 1, 49 = Center aligned 2, 50 = Right aligned
Range of *n*	0-2, 48-50
Default	0 (Left aligned)

Exceptions
The command is valid only at the beginning of a line.

12.5.7 SET LEFT MARGIN

Sets the left margin of the printing area. The left margin is set to ((*nH* X 256) + *nL*) dots.
The Set Printing Area Width command (1D 57), sets the width of the printing area. See the Set Printing Area Width command (1D 57) in this document for a description of that command.
If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 448. See the illustration.
The command is ignored if it is not at the beginning of the line.

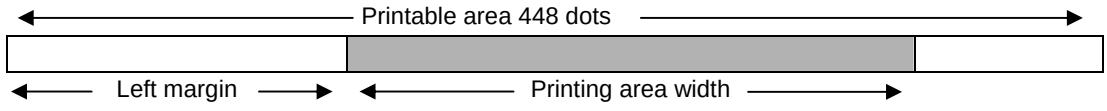
ASCII	GS L *nL nH*
Hexadecimal	**1D 4C *nL nH***
Decimal	29 76 *nL nH*
Range of *nL*	0-255
Range of *nH*	0-255
Default	448 dots (the maximum printable area)

Note: where *nL* is a multiple of 4.

Formulas
To set the left margin to one inch, send the four-byte string: GS L 203 0

Or, to set the left margin to two inches, send the four-byte string: GS L 150 1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



12.5.8 SET PRINTING AREA WIDTH

Sets the width of the printing area. If the setting exceeds the printable area, the maximum value of the printable area is used. The width of the printing area is set to ((*nH* X 256) + *nL*) dots.
The width of the printing area follows the Set Left Margin command (1D 4C). See the Set Left Margin command (GS L) earlier in this document for a description.
The command is ignored if it is not at the beginning of the line.

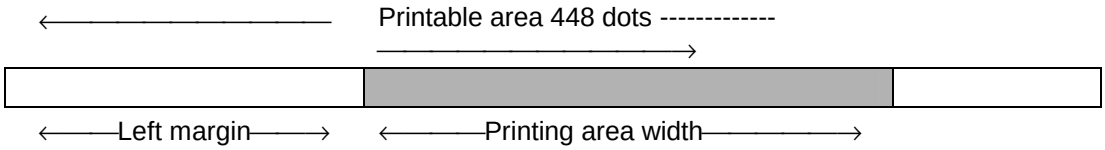
ASCII	GS W *nL nH*
Hexadecimal	**1D 57 *nL nH***
Decimal	29 87 *nL nH*
Range of *nL*	0-255
Range of *nH*	0-255
Default	448 dots (the maximum printable area)

Note: where *nL* is a multiple of 4.
Minimum print area width = 4

Formulas
To set the width of the printing area to one inch, send the four-byte string: GS W 203 0

Or, to set the width of the printing area to two inches, send the four-byte string: GS W 150 1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



Exceptions
This command is effective only at the beginning of a line.
If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 448 dots.

12.6 Print characteristics commands

These commands control what the printed information looks like, selection of character sets, and setting of margins. The commands are described in order of their hexadecimal codes.

12.6.1 SELECT PRINT MODE

Selects the print mode: standard, compressed, underlined, double high or doublewide.

ASCII ESC ! *n*
Hexadecimal **1B 21 *n***
Decimal 27 33 *n*

Value of *n:* See table

Value of *n*

Bit[1]	**Function**	**0**	**1**
Bit 0	Pitch (See chart below)	Standard Pitch	Compressed Pitch
Bit 4	Double High	Canceled	Set
Bit 5	Double Wide	Canceled	Set
Bit 7	Underlined Mode	Canceled	Set (bar thickness = 2)

[1] Bits 1, 2,3 and 6 are not used

Default 0 (for bits 0, 4, 5, 7)

This command affects the pitch selection.

Pitch	**CPI**
Standard	12.7
Compressed	16.9

Exceptions
Refer to the above table for exceptions.

Related Information
See the *Print Specifications Guide* for a description of standard and compressed character pitches.

12.6.2 SELECT OR CANCEL UNDERLINE MODE

Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, Set Relative Print Position commands, or in white/black reverse print mode.
Underline mode may also be turned ON and OFF with the Select Print Mode(s) command (1B 21).

ASCII ESC - *n*
Hexadecimal **1B 2D *n***
Decimal 27 45 *n*

Value of *n* 0.48 = Cancel underline mode
1-49 = Select underline mode and bar thickness = 2
2-50 = Select underline mode and bar thickness = 2
Default (Cancel underline mode)

12.6.3 SELECT OR CANCEL WHITE/BLACK REVERSE PRINT MODE

Turns on White/Black reverse printing mode. In White/Black reverse printing mode, print dots and non-print dots are reversed, which means that white characters are printed on a black background. When the White/Black reverse printing mode is selected it is also applied to character spacing which is set by Right-Side Character Spacing (ESC SP).
This command can be used with built-in characters and user-defined characters, but does not affect the space between lines.
White/Black Reverse Print Mode does not affect graphics, logos, bar code, HRI characters, and spacing skipped by Horizontal Tab (HT), Set Absolute Starting Position (ESC $), and Set Relative Print Position (ESC \).

ASCII GS B *n*
Hexadecimal **1D 42 *n***
Decimal 29 66 *n*
n is the least significant Bit, LSB

Value of *n* 0 = Off
1 = On
Default 0 (Off)

Exceptions
Only the lowest bit of *n* is valid.

12.7 Font commands

12.7.1 SELECT INTERNATIONAL CHARACTER SET

Selects the character set mapping to be used.

ASCII ESC R *n*
Hexadecimal **1B 52 *n***
Decimal 27 82 *n*

n	**Country**
0	USA
1	France
2	Germany
3	UK
4	Denmark I
5	Sweden
6	Italy
7	Spain
8	Japan
9	Norway
10	Denmark II

Default = 0

Additional codes

	n	**35_D 23_H**	**36_D 24_H**	**64_D 40_H**	**91_D $5B_H$**	**92_D $5C_H$**	**93_D $5D_H$**	**94_D $5E_H$**	**96_D 60_H**	**123_D $7B_H$**	**124_D $7C_H$**	**125_D $7D_H$**	**126_D $7E_H$**
U.S.A.	0	#	$	@	[	\	]	^	`	{	¦	}	~
France	1	#	$	à	°	ç	§	^	`	é	ù	è	"
Germany	2	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.	3	£	$	@	[	\	]	^	`	{	¦	}	~
Denmark I	4	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Sweden	5	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	6	#	$	@	°	\	é	^	ù	à	ò	è	i
Spain	7	Pt	$	@	i	Ñ	¿	^	`	"	ñ	}	~
Japan	8	#	$	@	[	¥	]	^	`	{	¦	}	~
Norway	9	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	10	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

12.8 Graphics commands

These commands are used to enter and print graphics data and are described in order of their hexadecimal codes.

12.8.1 PRINT RASTER GRAPHICS

Prints one row of data. *n*1 . .. *n*l: bytes describing the line to print.

ASCII	DC1 *n1 ...n*56
Hexadecimal	**11 *n1 ...n*56**
Decimal	17 *n1 ...n*56
Value of *n*	*n1…n56* = Data bytes
Range	0 - 255

12.9 Logo commands

12.9.1 SELECT THE CURRENT LOGO

Selects a logo to be defined or printed. The active logo *n* remains in use until this command is sent again with a different logo *n*, or command 1B40 is sent or printer reboots.

When this command precedes a logo definition, that definition is stored in flash memory as logo *n*. if there is already a different definition in flash memory for logo *n*, the first is inactivated and the new definition is used. The inactive definition is not erased from flash and continues to take up space in flash memory.

When this command precedes a logo print command and *n* is different from the previously active logo selected, the printer retrieves the logo definition for *n* from memory and prints it. If there is no definition for logo *n*, then no logo is printed.

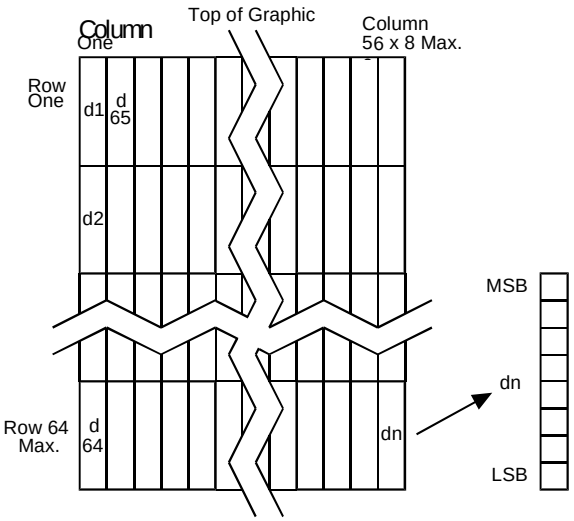
An application using multiple logos, into flash memory, is responsible for erasing the flash memory page when the logo area is full.

ASCII	GS # *n*
Hexadecimal	**1D 23 *n***
Decimal	29 35 *n*
Range of *n*	0 – 64

12.9.2 DEFINE DOWNLOADED BIT IMAGE

Enters a downloaded bit image (such as a logo) into Flash with the number of dots specified by *n*1 and *n*2. The downloaded bit image is available until another bit image is defined, or either Initialize Printer (1B 40 or 1D 40 31), command is received.

See the illustration below for a graphic representation of the downloaded bit image.



ASCII	GS * *n1 n2 d1 ... d*n
Hexadecimal	**1D 2A *n1 n2 d1 ... d*n**
Decimal	29 42 *n1 n2 d1 ... d*n

Value of *n*

Value of *n*1	Value of *n*2	Value of *d*
1-56 (8 x *n*1 = Number of Horizontal Dot Columns)	1-255 (Number of Vertical Bytes)[1]	Bytes of Data (Printed Down, Then Across)

[1]The number of bytes sent is represented by the following formula:

n = 8 x *n*1 x *n*2 (*n*1 x *n*2 must be less than or equal to 49138).

Exceptions:
See the illustration for the Print Downloaded Bit Image command (1D 2F) for a representation of the bit image.

12.9.3 PRINT DOWNLOADED BIT IMAGE

Prints the downloaded bit image at a density specified by *m*. It is ignored if any data is in the print buffer, if the downloaded bit image is undefined.

See the illustration on the previous page for a representation of the bit image.

ASCII	GS / *m*
Hexadecimal	**1D 2F *m***
Decimal	29 47 *m*

Value and Range of *m*

Value of *m*	Print Mode	Vertical DPI[1]	Horizontal DPI*
0	Normal	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

[1]Dot density measured in dots per inch

12.9.4 RETURN LOGO CHECKSUM

Returns the checksum of a logo downloaded using “Define Downloaded Bit Image”.

ASCII	US *e n*
Hexadecimal	**1F 65 *n***
Decimal	31 101 *n*

Returns 4 Bytes:
Command ID + Flag + checksum of the logo specified by n.

Byte 1 = 65h
Byte 2 = 01 - if logo n exists
- if logo n doesn’t exist.
Byte 3 = Checksum (LSB) or 00h if logo n doesn’t exist.
Byte 4 = Checksum (MSB) or 00h if logo n doesn’t exist.
Checksum is two’s complement of sum of **all** bytes in the download sequence.

Ex: Checksum = -(0x1D + 0x2A + …)
for the “Define Downloaded Bit Image” command.

12.10 Printer status commands

These commands enable the printer to communicate with the host computer. They are stored in the printer's data buffer as they are received, and are handled by the firmware in the order in which they were received.

When a fault occurs, the printer will go busy at the communication interface and not respond to either of the Printer Status commands. If the fault causing the busy condition can be cleared, such as by loading paper, or letting the thermal print head cool down, the printer will resume processing the data in its receive buffer.

Real Time commands allow the printer to respond immediately, even though it is busy at the communication interface. See the following section, Real Time Commands, for details about these commands.

12.10.1 TRANSMIT PAPER SENSOR STATUS

Sends status data to the host computer. The printer sends one byte to the host computer when it is not busy or in a fault condition. See the following table.

ASCII	ESC *v*
Hexadecimal	**1B 76**
Decimal	27 118

Values

Status Byte

Bit	Function	0 Signifies	1 Signifies
0	Receipt Paper	Present	Out
1	Receipt Cover	Closed	Open
2	Receipt Paper	Present	Out
3	Knife Position	Home Position	Not Home Position
4	Not Used	Fixed to Zero	Fixed to Zero
5	Temperature	In valid range	Too hot or too cold
6	Voltage	In valid range	Too high or too low
7	Not Used	Fixed to Zero	Fixed to Zero

Related Information
See Busy Line and Fault Conditions in the Real Time Commands section of this document for details about fault condition reporting.

12.10.2 TRANSMIT PRINTER ID

Transmits the printer model, type of version as defined below. This command is processed as normal printer data.

ASCII GS I *n*
Hexadecimal **1D 49 *n***
Decimal 29 73 *n*

Operand: *n* = printer ID select
Limit: Decimal: $1 \le n \le 2$; $49 \le n \le 50$; *n* = 66,67,68
Hex: $01 \le n \le 02$; $31 \le n \le 32$; *n* = 42,43,44

"GS I" OPERAND AND RETURNED STATUS DEFINITION

n		Printer ID	Function		Value	
Decimal	**Hex**				**Decimal**	**Hex**
1, 49	01, 31	Model	TPOS		49	31
2, 50	02, 32	Type	Bit	Function	Value	
					0	1
			0	2-byte character code	Not installed	Installed
			1	Knife	No knife	Installed
			2	Undefined		
			3	Undefined		
			4	Fixed	Always 0	-
			5	Undefined		
			6	Undefined		
			7	Fixed	Always 0	-
66	42	Manufacturer	AXIOHM			
67	43	Printer name	TPOS			
68	44	Serial number	Depends on actual S/N			

Note: for n = 66, 67, 68 the printer response is sent back in the following format.

Header: 5F (hex)
Data: ASCII string
NULL: 00 (hex)

12.10.3 TRANSMIT PRINTER ID, REMOTE DIAGNOSTICS EXTENSION

Performs the remote diagnostic functions specified by *n.*
Each returned message is defined as: *n* + data + <CR>

ASCII	GS I @ *n*
Hexadecimal	**1D 49 40 *n***
Decimal	29 73 64 *n*

Values of *n* *(Refer to table)*

Value of *n*		**Remote diagnostic item**		**Function**
Hex	**Dec**			
20	32	Serial #, 10 digit ASCII	*	Write to NVRAM Example, send 14 bytes to printer: GS I @ 0x20 1234567890
23	35	Serial #		Return Serial #, preceded by *n* to identify Printer returns 12 bytes in above example: #1234567890<CR>
24	36	Class/model #, 15 digit ASCII	*	Write to NVRAM
27	39	Class/model #		Return Class/model #, returns 17 bytes
2F	47	Boot firmware CRC, 4 digit ASCII		Return Boot firmware CRC, returns 6 bytes
37	55	Flash firmware CRC, 4 digit ASCII		Return Flash firmware CRC, returns 6 bytes
97	151	Boot firmware version		Return Boot firmware version, returns 6 bytes
A3	163	Flash firmware version		Return Flash firmware version, returns 6 bytes

***** 0 x 20 ⦸ digit ⊗0 x 7A
If any digit is out of the defined range, Write to NVRAM is ignored.

12.10.4 TRANSMIT STATUS

Transmits the status specified by *n*. This is a batch mode command which transmits the response after all prior data in the receive buffer has been processed. There may be a time lag between the printer receiving this command and transmitting the response, depending on the receive buffer status.

ASCII GS *r n*
Hexadecimal **1D 72 *n***
Decimal 29 114 *n*

Value of *n* 4, 52 = Flash memory User Sector status

The status bytes to be transmitted are described in the following two tables.

Flash memory User Sector Status (*n* = 4 or *n* = 52)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	Off	00	0	Not Used. Fixed to off
3	Off	00	0	Logo(s) defined.
	On	08	8	No logo defined.
4	Off	00	0	Not used. Fixed to off.
5	-	-	-	Undefined
6	Off	00	0	Not used. Fixed to off.
7	-	-	-	Undefined.

Exceptions
When *n* is out of the specified range, the command is ignored.

12.10.5 SEND PRINTER SOFTWARE VERSION

The printer returns 8 bytes containing the boot and flash software version.
The first 4 bytes returned are an ASCII string for the boot version.
The second 4 bytes are an ASCII string for the flash version.

Example: the printer returns 1.07 1.15
This means the boot version is 1.07 and the flash version is 1.15.

ASCII US V
Hexadecimal **1F 56**
Decimal 31 86

12.10.6 RETURN SRAM SIZE

Returns the size of SRAM on board, on one byte as number of 64 Kbytes sectors.

ASCII	GS BS
Hexadecimal	**1D 08**
Decimal	29 08

SRAM sizes	
6 kb (internal RAM only)	0
128 kb (w/extension)	2

12.10.7 TRANSMIT SELECTED A/D CHANNEL

Returns the size of SRAM on board, on one byte as number of 64 Kbytes sectors.

ASCII	GS / *m*
Hexadecimal	**1D 6C *m***
Decimal	29 108 *m*

Returns the voltage.

* *m* = 0 x 08
Sends an octet of between 0 and 255
= value measured on the A-D converter
= AD measure
Voltage (V) = 0.11274 x AD measure

Example:
AD measure = *213* =>Voltage = *24.01V*
AD measure = *186* => Voltage = *21.00V*

* *m* = 0 x 09
Sends an octet of between 0 and 255
= value measured on the temperature converter
= AD measure

RTH = 100 / ((255 / AD measure) - 1)
Temp (°C) = (3950 / (*ln* (RTH / 30) + 13.255)) - 273

Example:
AD measure = *60* => *Temp = 24.43°C*
AD measure = *27* => *Temp = 47.47°C*

***Note**: tolerance not taken into consideration and calculation not precise*

12.11 Real time commands

The Real Time commands provide an application interface to the printer even when the printer is not handling other commands.

- Real Time Status Transmission: DLE (Hex 10) Sequence
- Real Time Request to Printer: DLE (Hex 10) Sequence
- Real Time Printer Status Transmission

The original Printer Status commands, Transmit Printer Status (Hex 1B 76, ASCII ESC v) are placed in the printer's data buffer as they are received and handled by the firmware in the order in which they were received. If the paper exhausts while printing data that was in the buffer ahead of the status command, the printer goes busy at the communication interface and suspends processing the data in the buffer until paper is reloaded. This is true for all error conditions: knife home error, thermal print head overheating, etc. In addition, there is no way to restart the printer after a paper jam or other error.

The Real Time commands are provided to overcome these restrictions.

12.11.1 RULES FOR USING REAL TIME COMMANDS

Three situations must be understood when using real time commands:

1) The printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the host being ready to receive or not.

2) The printer transmits status whenever it recognizes a Real Time Status Transmission command sequence, even if that sequence happens to occur naturally within the data of another command, such as graphics data.
In this case the sequence will be processed both ways: as a real time command and as the graphics data it is intended to be when the graphics command is executed from the buffer. The result is that the host might receive status messages it has not requested.

3) If the printer is in error condition, meaning that the communication interface is likely to be busy, the host must be able to send the real time commands regardless of this busy state at the interface. Otherwise those commands wouldn't be received and processed.

12.11.2 MOVING DATA THROUGH THE BUFFER

Applications should not let the buffer fill up with Real Time commands when the printer is busy at the communication interface. A busy condition can be determined by bit 3 of the response to DLE EOT 1. Other responses to DLE EOT n can determine the reason for a particular busy condition.

Although the printer responds to Real Time commands when it is busy, it will place them into the buffer behind any other data there, and flush them out in the order in which they were received. When the printer is busy due simply to buffer full (that is, it can't print data as fast as it can receive it), then data continues to be processed out of the buffer at approximately print speed and the Real Time commands will eventually get flushed out.

When the printer is busy due to an error condition, then data stops being processed of the buffer until the condition clears one way or another. In either case, but more quickly in the case of an error condition, the buffer can fill with Real Time commands.

To guard against this situation, the application must determine the cause of a busy condition and take appropriate action or pace the Real Time commands to avoid filling the buffer. There is a minimum of 256 bytes available in the printer's buffer when it goes busy.

12.11.3 BUSY LINE AND FAULT CONDITIONS

If the printer is in error condition (cover is open, paper is exhausted…), the printer will go busy immediately. Then it will stay busy and stop processing data out of the receive buffer until the condition clears. It will respond to the Real Time commands as described below.

12.11.4 REAL TIME RECOVERY FROM FAULT

This command will select the recovery mode when the printer detects a fault condition. Any fault condition that prevents the printer from any printing function requires one of these commands to allow printing to resume.

	DLE Sequence
ASCII	DLE ENQ *n*
Hexadecimal	**10 05 *n***
Decimal	16 5 *n*

Operand *n* = recovery mode

Limit Decimal *n*
:
Hex: *n*

"DLE ENQ" OPERAND DEFINITION		
n		
Decimal	**Hex**	**Fault recovery mode**
2	02	Recovers from a fault after clearing the receive and print buffers. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this operand.

Notes:

- This command will attempt recovery from any fault that prevents printing including jams and paper out.
- Recovering from a print head over temperature condition is only accomplished by waiting until the print head has returned to its operating temperature range.
- This command will be ignored until manual intervention has occurred to clear the fault condition. The indication of manual intervention for clearing paper out, paper jams, cutter fault, consists of opening and closing the clamshell.

12.11.5 REAL TIME STATUS TRANSMISSION

Transmits the selected one byte printer status specified by *n* in Real Time according to the following parameters.

	DLE Sequence
ASCII	DLE EOT *n*
Hexadecimal	**10 04 *n***
Decimal	16 4 *n*

	DLE Sequence
Value of *n*	1 = Transmit printer status
	2 = Transmit communication interface busy status
	3 = Transmit error status
	4 = Transmit receipt paper status

Exceptions
The command is ignored if *n* is out of range.

Related Information

1 = Transmit Printer Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	On	04	4	Fixed to On.
3	Off On	00 08	0 8	Not busy at the communication interface. Printer is Busy at the communication interface.
4	On	10	16	Fixed to On.
5				Undefined.
6				Undefined.
7	Off	00	0	Fixed to Off.

2 = Transmit communication interface Busy Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off On	00 04	0 4	Cover closed. Cover open.
3	Off On	00 08	0 8	Paper feed button is not pressed. Paper feed button is pressed.
4	On	10	16	Fixed to On.
5	Off On	00 20	0 32	Printing not stopped due to paper condition. Printing stopped due to paper condition.
6	Off On	00 40	0 64	No error condition. Error condition exists in the printer.
7	Off	00	0	Fixed to Off.

3 = Transmit Error Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off	00	0	Fixed to Off.
3	Off On	00 08	0 8	No knife error. Knife error occurred.
4	On	10	16	Fixed to On.
5	Off On	00 20	0 32	No unrecoverable error. Unrecoverable error occurred.
6	Off On	00 40	0 64	Thermal print head temp. and power supply voltage are in range. Thermal print head temp. or power supply voltage are out of range.
7	Off	00	0	Fixed to Off

4 = Transmit Receipt Paper Status

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off On	00 04	0 4	Paper adequate Paper low (if paper low sensor enabled)
3	Off On	00 08	0 8	Paper adequate Paper low (if paper low sensor enabled)
4	On	10	16	Fixed to On
5	Off On	00 20	0 32	Paper present Paper exhausted
6	Off On	00 40	0 64	Paper present Paper exhausted
7	Off	00	0	Fixed to Off

12.12 Bar code commands

These commands format and print bar codes, and are described in order of their hexadecimal codes.

12.12.1 SELECT PRINTING POSITION OF HRI CHARACTERS

Prints HRI (Human Readable Interface) characters above or below the bar code.

ASCII GS H *n*
Hexadecimal **1D 48 *n***
Decimal 29 72 *n*

Value of *n* Printing position
0 = Not printed
1 = Above the bar code
2 = Below the bar code
3 = Both above and below the bar code
Default 0 (Not printed)

12.12.2 SELECT PITCH OF HRI CHARACTERS

Select font used to print HRI characters.

ASCII GS f *n*
Hexadecimal **1D 66 *n***
Decimal 29 102 *n*

Value of *n* 0 = Standard Pitch at 12.7 CPI
1 = Compressed Pitch at 16.9 CPI
Default 1 (Standard Pitch at 16.9 CPI)

12.12.3 SELECT BAR CODE HEIGHT

Sets the bar code height to *n* dots or *n*/203 inch (*n*/8 mm).

ASCII	GS h *n*
Hexadecimal	**1D 68 *n***
Decimal	29 104 *n*

Value of *n*	**Number of dots**
Range of *n*	1-255
Default	216

12.12.4 SELECT BAR CODE WIDTH

Sets the bar code module to *n*/203 inch (*n*/8 mm).

ASCII	GS w *n*
Hexadecimal	**1D 77 *n***
Decimal	29 119 *n*

Value of *n*	1 2, 3, 4, 5,6
Default	n=3
Formulas	*n*/203 inch (*n*/8 mm).

12.12.5 PRINT BAR CODE

Selects the bar code type and prints a bar code for the ASCII characters entered. If the width of the bar code exceeds one line, the bar code is not printed.
There are two variations to this command. The first variation uses a NULL character to terminate the string; the second uses a length byte at the beginning of the string to compensate for the Code 128 bar code that can accept a NULL character as part of the data. With the second variation the length of byte is specified at the beginning of the string.
Bar codes can be aligned left, center, or right using the Align Positions command (1B 61).
The check digit is calculated for UPC and JAN (EAN) codes if it is not sent from the host computer. Six-character zero-suppressed UPC-E tags are generated from full 11 or 12 characters sent from the host computer according to standard UPC-E rules. Start/Stop characters are added for Code 39 if they are not included.

	First Variation	Second Variation
ASCII	GS *k m d1…dk* NUL	GS *k m n d1…dn*
Hexadecimal	**1D 6B *m d1…dk* NUL**	**1D 6B *m n d1…dn***
Decimal	29 107 *m d1 dk* NUL	29 107 *m n d1…dn*

(0 = End of command)

Exceptions
The command is only valid at the beginning of a line.
Illegal data cancels the command.

Values
First Variation: Data string terminated with NULL Character

M	Bar Code	D	n, Length
0	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
1	UPC-E	48- 57	Fixed Length: 11, 12
2	JAN13 (EAN)	48- 57	Fixed Length: 12, 13
3	JAN8 (EAN)	48- 57	Fixed Length: 7,8
4	Code 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) d1 = dk = 42 (start/stop code is supplied by printer if necessary)	Variable Length
5	Interleaved 2 of 5	48- 57	Variable Length (Even Number)

Second Variation Length of Byte Specified at Beginning of String

Print Bar Code (*continued*)

The value of *m* selects the bar code system as described in the table.
The variable *d* indicates the character code to be encoded into the specified bar code system. See the table. If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	**Bar Code**	***D***	***n*, Length**
65	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
66	UPC-E	48- 57	Fixed Length: 11, 12
67	JAN13 (EAN)	48- 57	Fixed Length: 12, 13
68	JAN8 (EAN)	48- 57	Fixed Length: 7, 8
69	CODE39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) *d1* = *dk* = 42 (start/stop code is supplied by printer if necessary)	Variable
70	Interleaved 2 of 5 (ITF)	48- 57	Variable (Even Number)
73	Code 128	0-105 *d1* = 103-105 (must be a Start code) *d2* = 0-102 (data bytes) (Stop code is provided by the printer)	Variable

12.13 Flash firmware download commands

These commands are used to load firmware into the printer.

There are two ways to enter the download mode.
While the printer is running normally, send the command, “Switch to Flash Download Mode (1B 5B 7D)” to leave normal operation and enter the download mode.
If the Flash if found corrupted during Level 0 diagnostics the download mode is automatically entered after the printer has reset.

The printer never goes directly from the download mode to normal printer operation. To return to normal printer operation either the operator must turn the power off and then on to reboot or the application must send a command to cancel download mode and reboot.

When each flash download command is received, the printer returns either ACK or NAK to the host computer when each command is received:
ACK (hexadecimal 06)
Sent when the printer has received a host transmission and has completed the request successfully.
NAK (hexadecimal 15)
Sent when a request is unsuccessful.
The commands are listed in numerical order according to their hexadecimal codes. Each command is described and the hexadecimal, decimal, and ASCII codes are listed.
Communicates to the printer information downloaded from applications. Data is downloaded to flash memory to query the state of the firmware, calculate the firmware CRC and other functions.

12.13.1 Firmware Download Sequence

By providing a set of low-level commands, great freedom of implementation is given to customer application to customize the sequence to match its specific requirements.

Following is the description of a typical Firmware download sequence.
Only the main steps are mentioned.
Error checking and error recovery is not described:

1) Switch to Flash Download Mode

2) Check Flash Memory Size

3) Erase all Flash Memory sectors, except Boot Sector

4) Download Code to Active Flash Sector
   4.1) Select Flash memory sector #n (each sector contains 64kbytes)
      4.1.1) Program segment of N bytes
      4.1.2) if more segments, loop back to 4.1.1)
   4.2) if more sectors to program, loop back to 4.1)

5) Check Flash CRC

6) Reboot Printer

12.13.2 Commands

12.13.2.1 SWITCH TO FLASH DOWNLOAD MODE

Puts the printer in flash download mode in preparation to receive commands controlling the downloading of objects into flash memory. When this command is received, the printer leaves normal operation and can no longer print transactions until the Reboot the Printer command (1D FF) is received or the printer is rebooted.

This command does not affect the current communication parameters. Once the printer is in flash download mode, this command is no longer available.

ASCII	ESC [}
Hexadecimal	**1B 5B 7D**
Decimal	27 91 125

Related Information
See Entering Flash Download Mode elsewhere in this book to put the printer in flash download mode using the Configuration Menu.

12.13.2.2 REQUEST FLASH MEMORY SIZE

Returns the size of the flash used. There may be 2 sectors (64K each) in flash memory. This command assures that the firmware to be downloaded is the appropriate size for flash memory.

ASCII	GS SOH
Hexadecimal	**1D 01**
Decimal	29 1

The returned value corresponds to the highest sector number that can be accepted by the Select Sector to Download (1D 02 *nn*) command. :
1 = 128 Kbytes Flash

Exceptions
Available only in download mode.

12.13.2.3 SELECT FLASH MEMORY SECTOR TO DOWNLOAD

Selects the flash sector (nn) for which the next download operation applies. The values of the possible sector are restricted, depending upon the flash part type. The printer transmits an ACK if the sector number is acceptable or an NAK if the sector number is not acceptable. Sector numbers start at 0

ASCII	GS STX *nn*
Hexadecimal	**1D 02 *nn***
Decimal	29 2 *nn*

Value and Range of *n* 0-1 = 128k bytes Flash

Exceptions
Available only in download mode.

12.13.2.4 GET FLASH FIRMWARE CRC STATUS

Causes the printer to calculate the CRC for the Flash firmware code space and transmits the result.

This is performed normally after downloading completely a new firmware to verify that the downloaded firmware is valid

The printer transmits ACK if the calculated CRC is correct; NAK if the CRC is incorrect

ASCII	GS ACK
Hexadecimal	**1D 06**
Decimal	29 6

12.13.2.5 RETURN BOOT SECTOR CRC

Returns the CRC calculated over the boot sector code space.

ASCII	GS BEL
Hexadecimal	**1D 07**
Decimal	29 7

Formulas
ACK <low byte> <high byte>

12.13.2.6 ERASE ALL FLASH CONTENTS EXCEPT BOOT SECTOR

Causes the entire flash memory to be erased.
The printer returns ACK if the command is successful; NAK if it is unsuccessful.

ASCII	GS SO
Hexadecimal	**1D 0E**
Decimal	29 14

Exceptions
Available only in download mode.

12.13.2.7 RETURN MAIN PROGRAM FLASH CRC

Returns the CRC calculated over the flash firmware code space. The format of the response is ACK <low byte> <high byte>.

ASCII	GS SI
Hexadecimal	**1D 0F**
Decimal	29 15

12.13.2.8 ERASE SELECTED FLASH SECTOR

Erases the previously selected sector. The printer transmits ACK when the sector has been erased. If the previous sector is not successfully erased, or if no sector was selected, the printer transmits NAK.

ASCII	GS DLE *n*
Hexadecimal	**1D 10 *n***
Decimal	29 16 *n*

Value and Range of *n* 0-1 = 128k bytes Flash

Exceptions
Available only in download mode.

12.13.2.9 DOWNLOAD TO ACTIVE FLASH SECTOR

Contains a start address (ah x 256 + al) and count (ch x 256 + cl) of binary bytes to load into the selected sector, followed by that many bytes. The start address is relative to the start of the sector. Addresses run from 0 to 64K.

The printer may return one of several responses. ACK means that the data was written correctly and the host should transmit the next block. NAK means that, for some reason, the data was not written correctly. This could mean that communications failed or that the write to flash failed. The alternatives seem to be to retry the block or halt loading and assume a hardware failure.

ASCII	GS DC1 *al ah cl ch d1…dn*
Hexadecimal	**1D 11 *al ah cl ch d1…dn***
Decimal	29 17 *al ah cl ch d1…dn*

Value of *al*	= low byte of the address (it is sent before the high byte)
Value of *ah*	= high byte of the address (it is sent after the low byte)
Value of *cl*	= low byte of the count (it is sent before the high byte)
Value of *ch*	= high byte of the count (it is sent after the low byte)
Value of *d*	= data bytes, from 1 to *n*

Value of *n* (for number of data bytes)	**Range of Address (*al ah*)**	**Range of Count (*cl ch*)**
((ch * 256) + cl)	0000-FFFF (hexadecimal)	0001-FFFF (hexadecimal)

Range Addresses run from 0 to 64K.

Related Information
Available only in download mode.

12.13.2.10 ERASE BOOT SECTOR + DOWNLOAD NEW BOOT CODE

Wait for new boot code to be downloaded, then if CRC on this new boot code is valid, boot code sector is erased and reprogrammed with new code.
Printer automatically reboots after program sequence is complete.

ASCII	**US** SOH *d1 .. d*8192
Hexadecimal	**1F 01 *d1 .. d*8192**
Decimal	31 01 *d1 .. d*8192

Exceptions
Available only in download mode.

Note:
During erase and download sequence, power supply must be maintained at all times and no reset sequence should be performed.

12.14 *User flash memory commands*

12.14.1 ERASE USER FLASH SECTOR

Erases a section of user flash memory and sends a carriage return when the operation is complete.

ASCII	GS @ *n*	
Hexadecimal	**1D 40 *n***	
Decimal	29 64 *n*	
Value of *n*	49	*n* = 49 (ASCII *n* = 1)

This command erases all 64K Flash memory sectors allocated to logo storage. Those sectors should be erased: when the logo definition area is full and an application is attempting to define new logos. All logo definitions are erased and must be redefined.

Important: While erasing flash memory, all communication is disabled. To provide feedback to the application, the printer responds to the application when the erase is complete. After sending the Erase User Flash Sector (1D 40-n) command, an application should wait for the response from the printer before sending data. Otherwise, data will be lost. If an application is unable to receive data, it should wait a minimum of five seconds after sending the Erase User Flash Sector (1D 40 *n*) command before sending data.

12.14.2 RETURN USER FLASH MEMORY ALLOCATION STATUS

Returns the amount of Flash memory available in user section.

ASCII	US w *n*
Hexadecimal	**1F 77 *n***
Decimal	31 119 *n*
Value of *n*	49

Returns the number of bytes available as a zero terminated ASCII string. Each digit is coded in decimal.

12.15 *Peripheral control commands*

12.15.1 SET COMMUNICATION INTERFACE PARAMETERS

Synopsis: Setting communication parameters

ASCII	US	STX	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*
Hexadecimal	**1F**	**02**	***n1***	***n2***	***n3***	***n4***	***n5***	***n6***
Decimal	31	2	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*

Description:

n1	Interface
00h	RS232

n2, bit [0..2]	RS232 Baudrate
03h	9600
04h	19200
05h	38400
06h	57600
07h	115200

n2, bit 4	RS232 Number of stop bits
0	1
1	2

n2, bit 5	RS232 Number of data bits
0	8

n3	RS232 Parity
0x00	Odd parity
0x01	Even parity

n4	RS232 Parity mode
0x00	No parity
0x01	Enabled and set using parameter described above

n5	RS232 Handshaking
0x00	Xon/Xoff
0x01	DTR/DSR

n6	RS232 Parity Error Processing
0x00	Ignore
0x01	Print '?'

Notes: 1) This command is processed only in boot mode.
If the printer is running in normal mode, send first command “switch to Boot Mode” (1B 5B 7D).
2) This command must be followed by “Printer Reset” command (1D FF).

12.15.2 SET KNIFE OPTION

Synopsis: Set Knife Option

ASCII	US	ETX	STX	*n*
Hexadecimal	**1F**	**03**	**02**	***n***
Decimal	31	3	2	*n*

Operand: *n* = mode selection

Limit: Decimal: $0 \leq n \leq 1$
Hex: $00 \leq n \leq 01$

Description: This command will store the knife option in non-volatile memory.

Note:

KNIFE OPTION OPERAND DEFINITION		
N		
Decimal	**Hex**	**Mode**
0	00	Disabled
1	01	Enabled

This command must be followed by a reset.

12.15.3 SET PRINT DENSITY

Synopsis: Setting Print density

ASCII	US	VT	N	R	J	*n*
Hexadecimal	**1F**	**0B**	**4E**	**52**	**4A**	***n***
Decimal	31	11	83	80	69	*n*

Limit: Decimal: $80 \leq n \leq 120$

Hex: $50 \leq n \leq 78$

This command must be followed by a reset.

Note: where *n* must be a multiple of 5.

Description: Set the print density (energy applied to paper) in percent relative to nominal energy.

WARNINGS !!

Choose a print density setting no higher than necessary to achieve acceptable print density.

- **Failure to observe this rule may result in a printer service call.**
- **Failure to observe this rule may void the printer warranty.**
- **Consult your Axiohm technical support specialist if you have questions.**

12.15.4 SELECT OR CANCEL UNSOLICITED STATUS MODE

Synopsis: Select or cancel unsolicited status mode.

ASCII	GS	a	*n*
Hexadecimal	**1D**	**61**	**n**
Decimal	29	97	*n*

Value of n : 0 turns mode off.
Any non-zero value turns mode on.

Communication Interface USB : End point Reply	
n=[1;255]	Bulk In

Default: *n* = 0 (USM disabled)

Reply:

Byte 1 = Printer information
Byte 2 = Error information
Byte 3 = Paper information
Byte 4 = Paper information

Description: Selects whether the printer is to automatically return 4 bytes status string whenever the status changes.

Notes: This command uses the same sequence as older ASB (Auto Status Back) but has the following differences :

- The parameter n is an on/off switch. It does not select trigger subset

Any change in any of the following conditions will trigger the USM response

- Out of range Print head Temperature
- Out of range Voltage
- Door Open
- Cutter Jam
- Paper exhaust Status
- Flow Control
- Paper Feed Button Status

All 4 bytes of status are always transmitted.

Recoverable errors include paper out, temperature or voltage is out of range.

This command is processed as normal printer data.

12.15.5 RESET EEPROM

Synopsis: Reset EEPROM

ASCII	US	CR	C	L	E	*n*
Hexadecimal	**1F**	**0D**	**43**	**4C**	**45**	***n***
Decimal	31	13	67	76	69	*n*

Operand: *n* = security byte Limit: *n* = 0

Description: This command will reset the non-volatile memory configuration items to their default values.

Note: This command must be sent while the printer is in its boot-operating mode.
Once the configuration parameters are downloaded to the printer using this command, the printer must be reset before they take effect.

RESET EEPROM OPERAND DEFINITION		
n		
Decimal	**Hex**	**Reset**
0	00	Reset EEPROM

12.15.6 PRINT TEST FORM

Prints the current configuration settings on the receipt.

ASCII	US *t*
Hexadecimal	**1F 74**
Decimal	31 116

This command is effective only at the beginning of a line.

12.15.7 GENERATE PULSE FOR CDKO

Generates pulse for CDKO (Optional).

ASCII	ESC	p	m	n1	n2
Hexadecimal	**1B**	**70**	**m**	**n1**	**n2**
Decimal	27	112	m	n1	n2

Operand: m Selected connector pin
n1 Ton = (n1 * 2ms) Is the on time of the pulse
n2 Toff = (n2 * 2ms) Is the off time of the pulse

Limits: m = 0 , 1 , 48 , 49
$0 < n1 \leq n2 \leq 255$
If n2 < n1 ➔ Toff = (n1 * 2ms)

Description: Generates a pulse Ton, Toff on pin **m** of the drawer kick out connector in accordance with the table below.

m decimal	Connector	Pin
0 or 48	Drawer Kick-Out	2
1 or 49	Drawer Kick-Out (1)	5

(1) Common with drawer pin 2.

13 TROUBLESHOOTING

Axiohm printers are simple and generally trouble-free, but from time to time minor problems may occur. Follow these procedures to determine the cause and resolution of any problems the printer may be having. If the procedures in this section do not correct the problem, contact a service representative.

13.1 Light indicator

When light is on continuously, the printer is ready to operate.
When light is flashing, an error occurs.

13.2 Problems & Solutions

13.2.1 Printer Problems

Problem	**What to Do**
Printer does not function when turned on.	Check that printer cables are properly connected on both ends. When using the USB interface, check if the USB LED indicates data transmission. Check if the On/Off button is in On position. Check that the host or power supply is getting power.
Printer LED is off.	Check the power-supply and cable connections.
Printer LED is continuously on but printer does not operate.	Check if the interface cable is properly connected.
Printer LED is flashing.	Auto-cutter: Check that the mobile blade does not interfere with the cover blade. Remove the Paper jam button. Using a screwdriver; turn the gear until the blade disappears. Then open the cover and check that there is no paper jam. **Important**: Do not press on the switch when the cover is opened. Then close the cover. If the LED is still flashing, see LED diagnostic. Manual cutter: Check that the cover is properly closed; if not close it. Open the cover and make sure there is paper left in the printer; if not, remove the paper roll core, place a new paper roll as indicated in the chapter "Loading paper". See LED diagnostic. Open the cover and make sure there is no paper jam. In case of paper jam, unwind the paper until no more wrinkle appear; close the cover with the wrinkled part out and cut it with the tear bar. If the LED is still flashing, see LED diagnostic.

13.2.2 Printer LED Diagnostic

Problem	Possible Causes	What to Do
LED, slow continuous flashing (1 flash / sec or more).	Out of paper.	Put in a new paper roll.
	Cover is off.	Put the cover on.
	Knife is unable to home.	Contact your authorized service representative.
	Print head is too hot.	Turn the printer off (*unplug*).
	Voltages are out of range.	Contact your authorized service representative.
Flashing LED in various combinations.		These indicate serious problems. Contact your authorized service representative.
Fast continuous flashing of LED:	Main Program CRC Test Failure.	
	Auto cutter: The cover is opened and the cutter is not in its normal position.	Turn the gear using a screwdriver until the LED flashes slowly. Check that the mobile blade is not interfering with the cover. Then close the cover.
	Manual cutter: (no mobile blade) You are in auto cutter mode.	Open the cover and refer to the chapter "Set knife option" to disable the knife. If the problem continues, please contact your authorized service representative.

13.2.3 Printing Problems

Problem	Possible Causes	What to Do
Print quality is deteriorating.	Print head may be getting dirty.	See next chapter ”Cleaning your printer”.
Colored stripe on the receipt.	Paper is low.	Change the paper.
Receipt does not come out all the way.	Paper is jammed.	Auto-cutter: Check that the mobile blade does not interfere with the cover blade. Remove the Paper jam button. Using a screwdriver; turn the gear until the blade disappears. Then open the cover and check that there is no paper jam.
Printer starts to print, but stops while the receipt is being printed.	Paper is jammed.	**Important**: Do not press on the switch when the cover is opened. Then close the cover. If the LED is still flashing, see LED diagnostic. Manual cutter: Check that the cover is properly closed; if not close it. Open the cover and make sure there is paper left in the printer; if not, remove the paper roll core, place a new paper roll as indicated in the chapter "Loading paper". See LED diagnostic. Open the cover and make sure there is no paper jam. In case of paper jam, unwind the paper until no more wrinkle appear; close the cover with the wrinkled part out and cut it with the tear bar. If the LED is still flashing, see LED diagnostic.
Print is light or spotty.	Paper roll is loaded incorrectly.	Check that the paper is loaded properly.
	Thermal print head is dirty.	Use recommended thermal receipt paper. See next chapter "Cleaning your printer".
	Variations in paper.	Increase print density in “Set Hardware Options” of printer Configuration Menu as needed.
Vertical column of print is missing.	This indicates a serious problem with the printer electronics.	Contact your authorized service representative.
One side of receipt is missing.	This indicates a serious problem with the printer electronics.	Contact your authorized service representative.

13.2.4 Auto Cutting Problems

Problem	What to Do	What to Do
The ticket is out of the printer, but the cutter does not cut.	Cut command is not used correctly.	Review the User Manual command sets.
	Faulty cutter.	Contact your authorized service representative.
Total cuts instead of partial cuts.	Un-adapted partial cut setting	Contact your authorized service representative.
Cutter jam.	Paper used is too thick. Intrusion of external object.	Auto-cutter: Check that the mobile blade does not interfere with the cover blade. Remove the Paper jam button. Using a screwdriver; turn the gear until the blade disappears. Then open the cover and check that there is no paper jam. **Important**: Do not press on the switch when the cover is opened. Then close the cover. If the LED is still flashing, see LED diagnostic. Then close the cover. If the LED is still flashing, see LED diagnostic.

14 CLEANING YOUR PRINTER

Depending on the environment in which the printer is used, it can accumulate dust. Therefore it is necessary to clean it periodically to maintain a good print quality. The cleaning period depends on the environment and the usage of the printer, but the print head should be cleaned at least once a year or up to one month in heavy duty applications.

Cleaning Instructions:

- Unplug the printer. **Never clean the head immediately after printing, the head may be hot.**
- Open the cover, clean the heating dots line of the head with a cotton stick containing a solvent alcohol (ethanol, methanol, or IPA) but **do not touch the print head with your fingers**!
- Allow the solvent to dry and close the cover.
- N.B **AXIOHM can provide cleaning kits Ref : CK60000A**

15 SPARES

All spare parts kits are supplied as individually packaged loose parts.

Reference	Designation	Contents
A3107446	POWER SUPPLY KIT TPOS EU (12 items/kit)	Lot of: 12 power supplies 24V DC 2,5A
For Products:	TPOS200x-Exx, TPOS210x-Exx	12 European cables
A3107447	POWER SUPPLY KIT TPOS US (12 items/kit)	Lot of: 12 power supplies 24V DC 2,5A
For Products:	TPOS200x-Uxx, TPOS210x-Uxx	12 US cable
A3107448	POWER SUPPLY KIT TPOS GB (12 items/kit)	Lot of: 12 power supplies 24V DC 2,5A
For Products:	TPOS200x-Gxx, TPOS210x-Gxx	12 Great Britain cable
A3107589	POWER SUPPLY KIT TPOS AUST (12 items/kit)	Lot of: 12 power supplies 24V DC 2,5A
For Products:	TPOS200x-Axx, TPOS210x-Axx	12 Great Britain cable
CK60000A	CLEANING KIT 60MM AXIOHM (10 units/kit)	Lot of:
For Products:	All	10 cleaning kits 60mm